CLAIMS

What is claimed is:

1. A method of processing an organic memory device, comprising: forming an electrode on a substrate;

forming an organic semiconductor layer, comprising an organic polymer, over the electrode;

depositing a silicon-based resist layer over the organic semiconductor layer; patterning the silicon-based resist layer, and

using the patterned silicon-based resist layer as a mask, patterning the organic semiconductor layer.

- 2. The method of claim 1, further comprising depositing a passive material over the electrode.
- 3. The method of claim 1, wherein the silicon-based resist layer is deposited by spinon techniques.
- 4. The method of claim 1, wherein patterning the organic semiconductor layer comprises contacting an oxygen plasma with the organic semiconductor layer.
- 5. The method of claim 1, wherein the silicon-based resist layer is patterned using an organic solvent or a hydroxide solution.
- 6. The method of claim 1, further comprising forming a second electrode over the patterned organic semiconductor layer to form an organic memory cell.
- 7. The method of claim 1, wherein the silicon-based resist layer comprises one of a polysiloxane and a silsesquioxane.

- 8. The method of claim 1, wherein pattering the silicon-based resist layer comprises irradiating the silicon-based resist layer with light having a wavelength of about 248 nanometers or less.
- 9. The method of claim 1, wherein the organic polymer comprises at least one of polyacetylene, polyphenylacetylene, polydiphenylacetylene, polyaniline, poly(p-phenylene vinylene), polythiophene, polyporphyrins, porphyrinic macrocycles, thiol derivatized polyporphyrins, polymetallocenes, polyferrocenes, polyphthalocyanines, polyvinylenes, and polypyrroles.
- 10. The method of claim 2, wherein the passive material comprises copper sulfide.
- 11. The method of claim 1, further comprising forming a partitioning component on the substrate.
- 12. The method of claim 11, the partitioning component comprises at least one of a diode, a thin-filmed diode (TFD), a zener diode, an LED, a transistor, a thin-filmed transistor (TFT), a Silicon Controlled Rectifier (SCR), Uni Junction Transistor (UJT), and a Field Effect Transistor (FET).
- 13. The method of claim 1, the method comprising using at least one of a single and dual damascene process.
- 14. A system to produce an organic memory device, comprising: means for forming an organic semiconductor layer over an electrode; means for applying a silicon-based resist layer over the organic semiconductor layer;
 - means for patterning the silicon-based resist layer, and means for patterning the organic semiconductor layer.

- 15. The system of claim 14, further comprising depositing a passive material over the electrode, wherein the passive material comprises copper sulfide.
- 16. The system of claim 14, wherein the silicon-based resist layer comprises one of a polysiloxane and a silsesquioxane.
- 17. The method of claim 14, wherein patterning the silicon-based resist layer comprises irradiating the silicon-based resist layer with light having a wavelength of about 248 nanometers or less.
- 18. The method of claim 14, further comprising forming a second electrode over the patterned organic semiconductor layer to form an organic memory cell.
- 19. The method of claim 14, wherein patterning the organic semiconductor layer comprises contacting an oxygen plasma with the organic semiconductor layer.
- 20. A method of forming an organic memory device, comprising: forming a first electrode using a damascene process; forming a passive material over the first electrode; forming an organic semiconductor material on the passive material; forming a silicon-based resist layer over the organic semiconductor material; developing the silicon-based resist layer to expose a portion of the organic semiconductor material;

etching the exposed portion of the organic semiconductor material, and forming a second electrode over the organic semiconductor material to operatively couple the first electrode and the second electrode.